Ordering number : EN 3045

Monolithic Linear IC

No.3045

SANYO

LA7533

IF Signal Processing (VIF + SIF) Circuit for TV / VCR Use

The LA7533 is an IC containing the VIF section and SIF section on a single chip in the DIP20S package. The use of the small-sized package serves to make VTR tuner units smaller.
As compared with the LA7530N, the LA7533 is improved in characteristics when it is operated at supply voltage 9V (DG, DP, RF AGC temperature characteristics).
The LA7533 is applicable to the circuit designed for the LA7530N.

Functions

- VIF section: VIF AMP, VIDEO DET, PEAK IF AGC, B/W NOISE CANCELLER, RF AGC, AFT, VIDEO MUTE.
- SIF section: SIF LIMITER AMP, FM DET, SND MUTE.

Features

- High-gain VIF amp requiring no preamp.
- Higher AGC speed.
- Adjustment-free FM detector because of ceramic discriminator-used quadrature detection.
- Possible to mute video, sound for VTR.
- Small-sized package.
- Minimum number of external parts required.
- Operated at supply voltage 9V

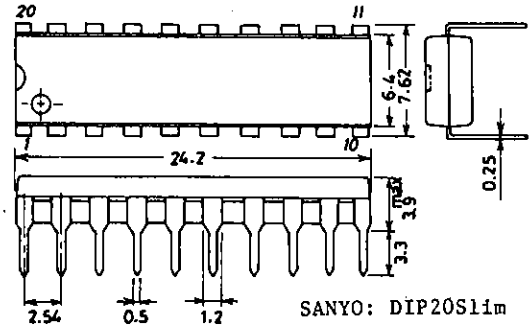
Maximum Ratings at Ta = 25°C

				unit
Maximum Supply Voltage	V_{CC} max		14	V
External Flow-out Current	I_{16} max		5	mA
Pin 20 Maximum Supply Voltage	V_{20} max		V_{CC}	V
Allowable Power Dissipation	Pd max	Ta≦40°C	1.1	W
Operating Temperature	Topr		−20 to +70	°C
Storage Temperature	Tstg		−55 to +125	°C

Operating Conditions at Ta = 25°C

			unit
Recommended Supply Voltage	V_{CC}	9	V
Operating Voltage Range	V_{CC} op	8.1 to 13.2	V

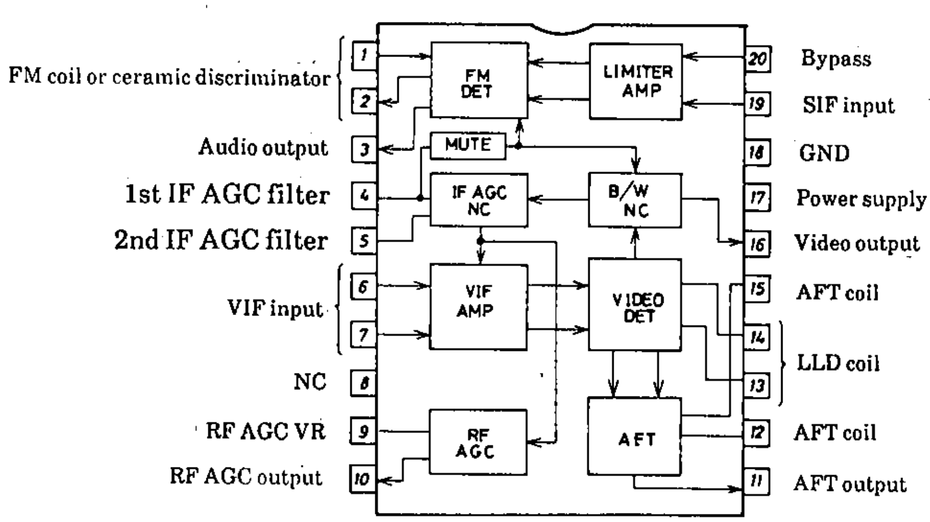
Package Dimensions
(unit : mm)
3021B



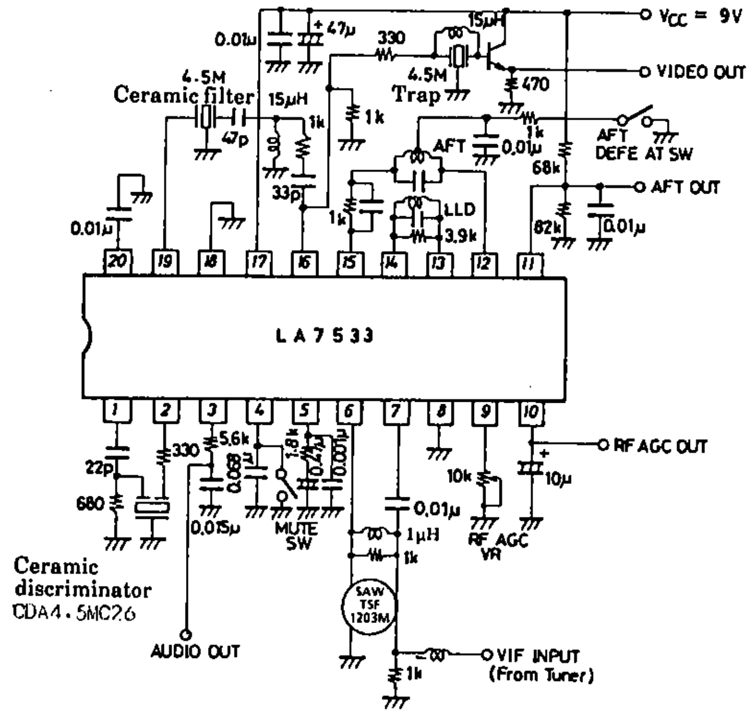
Operating Characteristics at $Ta=25°C, V_{CC}=9V, f_p=58.75MHz, f_s=54.25MHz(VIF), f_o=4.5MHz(SIF)$

			min	typ	max	unit
Total Circuit Current	I_{17}	DC	40	49	63	mA
Maximum RF AGC Voltage	V_{10H}	DC	6.2	6.5	6.8	V
Minimum RF AGC Voltage	V_{10L}	DC		0.1	0.5	V
Quiescent Video OutputVoltage	V_{16}	DC	4.2	4.6	5.0	V
Quiescent AFT Ouptut Voltage	V_{11}	DC	2.9	4.9	5.9	V
Input Sensitivity	V_i	$f_m=400Hz$ 40%AM, $V_o=0.8Vp\text{-}p$	31	37	42	dBμ
AGC Range	GR	$f_m=400Hz$ 40%AM, $V_o=0.8Vp\text{-}p$	57	63		dB
Maximum Allowable Input	V_i max	$f_m=15kHz$ 78%AM, $V_o=\pm1dB$	90	130		mVrms
Video Output Amplitude	$V_{o(VIDEO)}$	$V_i=10mVrms$, $f_m=15kHz$ 78%AM	1.4	1.65	1.9	Vp-p
Output S/N	S/N	$V_i=10mVrms$ CW	48	53		dB
Carrier Leak	CL	$V_i=100mVrms$, $f_m=15kHz$ 78%AM	50	55		dB
Maximum AFT Voltage	V_{11H}	$V_i=10mVrms$ SWEEP	8.1	8.5	8.9	V
Minimum AFT Voltage	V_{11L}	$V_i=10mVrms$ SWEEP	0.1	0.4	0.9	V
AFT Detection Sensitivity	S_f	$V_i=10mVrms$ SWEEP	45	70	90	mV/kHz
White Noise Threshold Level	V_{WTH}	$V_i=10mVrms$ SWEEP	4.7	5.1	5.5	V
White Noise Clamp Level	V_{WCL}	$V_i=10mVrms$ SWEEP	2.9	3.3	3.7	V
Black Noise Threshold Level	V_{BTH}	$V_i=10mVrms$ SWEEP	1.6	1.85	2.1	V
Black Noise Clamp Level	V_{BCL}	$V_i=10mVrms$ SWEEP	2.6	2.9	3.2	V
SIF Output Signal Voltage	$V_{o(SIF)}$	P/S=20dB	70	100	140	mVrms
Frequency Characteristic	f_c	−3dB	5	7		MHz
Differential Gain	DG	$V_i=-27dBm$ (peak) 87.5% VIDEOMOD		3		%
Differential Phase	DP	$V_i=-27dBm$ (peak) 87.5% VIDEOMOD		3		deg
VIF Input Resistance	r_i			1.5		kΩ
VIF Input Capacitance	c_i			3.0		pF
SIF Limiting Voltage	$V_{i(lim)}$	−3dB		300	600	μVrms
Detection Output Voltage	$V_{o(DET)}$	$V_i=100mVrms, f_m=400Hz$, $\Delta f=\pm25kHz$	440	670	800	mVrms
Total Harmonic Distortion	$THD_{(DET)}$	$V_i=100mVrms, f_m=400Hz$, $\Delta f=\pm25kHz$		0.6	1.5	%
AM Rejection	AMR	$V_i=100mVrms, f_m=400Hz$, $\Delta f=\pm25kHz$ 30%AM	50	60		dB
Noise Output Voltage	V_N				3.5	mVrms
Pin 4 Muting Start Voltage	$V_{M(4)}$		0.3	0.5		V
Pin 20 Muting Attenuation	$ATT_{M(20)}$		60			dB

Equivalent Circuit Block Diagram



Sample Application Circuit (USA)



Unit (resistance:Ω, capacitance:F)

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